

Radiation Hard Monolithic SDRAM to Support DDR2 and DDR3 Architectures, Phase I

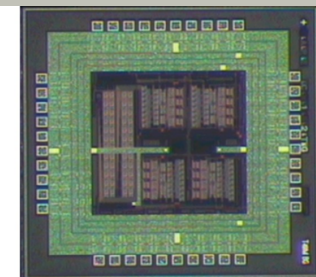
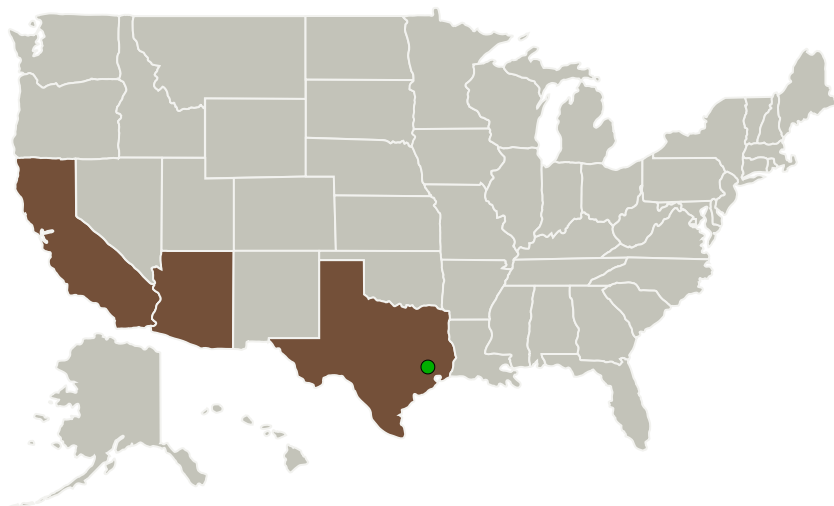
Completed Technology Project (2013 - 2014)



Project Introduction

There is no rad hard SDRAM currently available to support DDR2 and DDR3 applications. Space Micro proposes to build a radiation hardened by design (RHBD) SDRAM memory, using a modified version of our HF-Core Memory Controller to solve all the single event effects issues (SEU, SEFI and multiple bit errors). The RHBD SDRAM will be manufactured on known radiation characterized eDRAM (embedded DRAM) ASIC processes: either TSMC or IBM for a Phase II demonstration. The resulting RH-eDRAM (our name for this device), fabricated on a 130 nm process, provides 128 Mbit of radiation hardened (SEU, SEFI, SEL and TID) memory, while a 90 nm IBM process would result in 512 Mbit of DRAM. The RH-eDRAM solves the space reliability problems with a well-understood set of solutions applied:

Primary U.S. Work Locations and Key Partners



Radiation hard Monolithic SDRAM to support DDR2 and DDR3 architectures Project Image

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Organizations Performing Work	Role	Type	Location
Space Micro, Inc.	Lead Organization	Industry	San Diego, California
Arizona State University-Tempe(ASU)	Supporting Organization	Academia	Tempe, Arizona
● Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations	
Arizona	California
Texas	

Project Transitions

**May 2013:** Project Start**May 2014:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/140476>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Space Micro, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Bert R Vermeire

Co-Investigator:

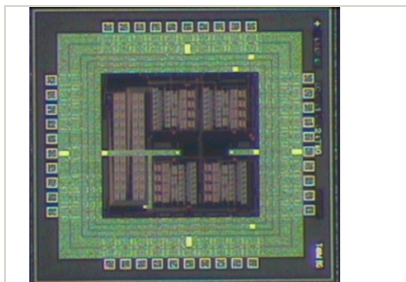
Bert Vermeire

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Images

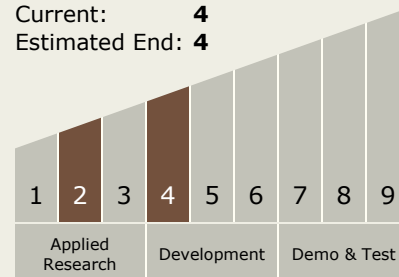


Project Image

Radiation hard Monolithic SDRAM to support DDR2 and DDR3 architectures Project Image
(<https://techport.nasa.gov/image/133380>)

Technology Maturity (TRL)

Start: 2
Current: 4
Estimated End: 4



Technology Areas

Primary:

- TX10 Autonomous Systems
 - TX10.1 Situational and Self Awareness
 - TX10.1.4 Hazard Assessment

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System